

## TMF SUPPLEMENT

### TMF Site Selection Discussion Points for USACE JPA Questions January 25, 2021:

USACE has raised several questions regarding the TMF site selection. Before addressing these specific questions in detail, BWRR would like to note several important points:

#### A. Project Purpose & Need

1. The established purpose of the SCMAGLEV Project is to evaluate, and ultimately construct and operate a safe, commercially viable, high-speed ground transportation system that achieves SCMAGLEV's optimum operating speed to significantly reduce travel time to help meet the capacity and ridership needs of the Baltimore-Washington region.
2. The Corps previously concurred with the FRA's statement of Project purpose and need on September 7, 2017. This concurrence was qualified by the Corps stating that for purposes of its Section 404 review the Project purpose was simply *"to construct and operate a high-speed SCMAGLEV technology in the Baltimore-Washington corridor."*

#### B. Operational Requirements

1. Central Japan Railway Company ("JRC") is the only operator of SCMAGLEV technology in the world. Constructing and operating the SCMAGLEV system in the Baltimore-Washington corridor must comply with JRC's extensively proven and tested system criteria. This ensures the system will meet JRC operational performance, reliability, maintenance and safety standards. If the Project's design does not meet JRC's standards, then the Project cannot be constructed and operated and, therefore, fails to meet the Corps' purpose for the project.
2. Deviations from JRC's system would create significant operational problems for the Baltimore-Washington project. This is especially true of the TMF, a critical component of the overall Project. After extensive analysis and discussion, BWRR and JRC have concluded that the TMF design for the Baltimore-Washington Project must be based on JRC's TMF in Chubu, Japan. This is a real-world design and is the most compact available for a TMF, which results in an 24% reduction in TMF size from the original ARDS proposal of approximately 235 acres to 180 acres. The Chubu design is technically feasible and meets technology and logistical requirements, while the disaggregated TMF concept has never been deployed, creates significant logistical problems, and would not meet JRC system criteria, while requiring a larger footprint. Further, the TMF should be located as close as possible to Washington DC, the terminal station of the system. This allows for efficient exchange of trainsets with minimal interruption to service. Specifically, the following conditions need to be met:
  - i. **The layout of the Baltimore-Washington SCMAGLEV TMF shall be designed based on JRC's SCMAGLEV TMF in Chubu, Japan.** During the nighttime: (a) all trainsets will be returning from the terminal station to the TMF storage tracks after completing their daily operations; and (b) trainsets arriving at the storage

tracks will need to proceed to the inspection shop for inspection, one by one. Thus, there will be frequent movements between the storage tracks and the inspection shop. In order to handle (a) and (b) the TMF ramps, storage tracks and inspection tracks need to be arranged linearly so that both movements can be handled at the same time. Additionally, because trainsets are coming from the terminal station where daily operations end, the TMF ramps need to be designed so that the trainsets can directly enter the TMF, rather than having to “switch back” through multiple movements.

The required SCMAGLEV TMF layout is similar to TMFs for conventional steel-wheel/steel-rail railways, that is with the linear progression from storage tracks to the inspection shop. Indeed the California High Speed Rail design criteria for its TMF also calls for a consolidated TMF noting that any deviation from the “optimal” layout and size would have negative implications for the railroad’s operations and its operating costs. Like the California High Speed Rail Authority and other railroads planning multi-billion-dollar projects with public funds, it is not prudent for BWRR to design a system with sub-optimal features, such as, a disaggregated TMF. While the Baltimore station is a terminal station for first phase of the Project between Washington, DC and Baltimore, it will become an intermediate station when the system is extended to New York. Tail tracks allow a disabled train to be moved beyond the station in Baltimore without occupying a platform at the station and disrupting service. Whereas in Washington, DC a disabled train would have to occupy a platform until it could be moved to the TMF.

- ii. **The daily overnight maintenance period for the SCMAGLEV system cannot be reduced.** The minimum window required for maintenance is fixed and there is no flexibility to modify it. Safety is of paramount importance so maintenance periods cannot be lessened. Therefore, any deviation from the design criteria (i) above would result in longer maintenance periods and, in turn, require BWRR to reduce operating hours, and thereby limit ridership and reduce the revenue needed to cover fixed costs. While it is not possible to precisely calculate the reduction in operating hours, ridership, and revenue, it is likely to be severe, and would become worse as demand increases over time. Therefore, the Project would not be constructable or operable and would fail to meet the Project purpose and need.
- iii. **Reliability is a further requirement of the SCMAGLEV system.** The Tokaido Shinkansen (“bullet train”) operated by JRC between Tokyo and Osaka transports nearly 150 million people per year, with an annual average delay of less than 30 seconds and no fatalities since system was inaugurated in 1964. This performance is achieved through strict compliance with standards, and no system technical compromises are allowed. JRC has applied the lessons from this strong record of reliable and safe performance in planning and designing the SCMAGLEV system.

### **C. Site Impacts and Property Acquisitions**

1. Maryland Governor Larry Hogan, through a letter from the MDOT Secretary of Transportation dated September 5, 2017, stated that his administration “...will continue to

*stand firmly against any proposed routes that would harm local communities or affect the quality of life of the citizens along the proposed path. We simply won't allow that to happen.*" That directive from the Maryland State Government was the basis for dropping the WB&A alignment from consideration. BWRR notes that there was no objection from the Corps or any other agency on that alternative's elimination. From then on, BWRR and FRA, in addition to MDOT, considered acquiring residences as a critical criteria when assessing the environmental impact of Project alternatives, including TMFs.

2. The FRA and MDOT NEPA team and BWRR weighed residential displacements as a factor in evaluating potential TMF sites. After extensive review, public and interagency meetings and discussion, the FRA/MDOT Alternatives Retained for Detailed Study (ARDS) Report, determined sites on BARC and near Maryland Route 198 (MD-198) were the only potential practicable options.
3. USACE concurred with the ARDS Report stating: "For the SCMAGLEV Alternatives Report, the U.S. Army Corps of Engineers concurs with the condition that all alternatives will be retained in the Draft Environmental Impact Statement." No TMF alternatives other than BARC and 198 were in the ARDS Report and both of them were retained for the DEIS.

### **Responses to Specific Questions from USACE**

The following questions were raised in the USACE letter dated January 25, 2021. BWRR's responses to each question are as follows:

#### **TMF Alternatives**

**USACE #1:** *The Corps must ensure that the TMF is located at the least environmentally damaging practicable site. The Corps is concerned that the three TMFs evaluated in the DEIS and JPA (BARC West, BARC East, and MD 198) may not be the least damaging alternatives in their currently designed footprints. Additionally, if these TMF properties become unavailable or not capable of being constructed for certain reasons, no other TMF options are evaluated. The Corps has determined that this is not prudent for a project of this magnitude. Therefore, additional TMF facilities dropped from the analysis must be reconsidered and the analysis submitted to the Corps for review.*

**BWRR Response:** As an initial matter, the TMF site must meet the JRC SCMAGLEV technical requirements. Once past that threshold, BWRR is in full agreement that the TMF be located at the least environmentally damaging practicable site. As defined by 40 CFR 230.10(a)(2) h, Practicable Alternatives are those that are "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." BWRR's TMF Assessment Memo (Exhibit J of the JPA) was prepared at the request of FRA when BWRR notified FRA that the TMF footprint could be reduced from the 235-acre site in the ARDS Report to a 180 acres site based on the Chubu TMF footprint. FRA specifically requested the report ensure the entire project corridor be evaluated for the 180-acre footprint.

After extensive study and coordination, BWRR concluded that there were no further sites in the corridor that could meet the TMF siting criteria, other than the two BARC options and, potentially, the MD-198 option. It is noted that no detailed engineering, for example, engineering of ramp connections, was conducted as part of the Memo before other TMF sites considered were dismissed. BARC West was added at that time because of concerns expressed about BARC East in the ARDS Report. The BARC TMF alternate considered in the ARDS Report was modified to utilize a disused airfield, taking advantage of the already disturbed space.

Use of BARC land for a TMF is logical due to its location in the corridor, the large volume of land available (over 6,000 acres), the compatibility with its current use (bisected by MD 295, various alternate uses on property, disused structures, etc.), and the history of BARC land being used for non-agricultural purposes, among them a rail maintenance yard facility (WMATA's Greenbelt facility) and the current proposed use of BARC land for the new Bureau of Engraving and Printing (BPE) facility. Like WMATA and BPE, SCMAGLEV serves a public use by virtue of the franchise granted by the Maryland Public Service Commission to BWRR to operate a railroad in Maryland.

Although BWRR's analysis concludes that BARC East or West are the only Practicable TMF Alternatives, FRA requested that the MD-198 TMF alternative be included in the DEIS, to which BWRR agreed.

**USACE # 2:** *The Corps understands that TMF footprints were increased to accommodate a 16-car train, as opposed to the initially proposed 12-car train. Factors mentioned for the increased train car length included the need to accommodate U.S. standards for larger seats, restrooms, luggage storage, and ADA requirements. Other than ADA, are these standards required by U.S. law, or standards designed to accommodate rider comfort? Please specify the standards that dictated this change. Please be advised that the Corps continues to evaluate the 12-car trainset design for TMF practicability and minimization of environmental impacts. How would the TMF footprints and impacts to wetland and waterways change with a TMF based on a 12-car trainset?*

**BWRR Response:** Ridership forecasts drove the need for 16 car trainsets. All facilities, including stations and the TMF, were designed for 16-car trainsets. A 12-car trainset was considered during the alternatives analysis but subsequently rejected from consideration for reasons noted in the DEIS. FRA's review of BWRR's ridership analysis was not completed until after the ARDS Report was published. It should be noted that FRA accepted BWRR's Ridership Report. As noted, the ridership is the basis for sizing trainsets to 16 cars as being the capacity needed to carry demand for SCMAGLEV.

Shifting from a 16-car train to a 12-car train is not simply a matter of adding or reducing cars. Various aspects of the system must be designed to accommodate a specific trainset length including stations boarding gates, platforms, the TMF, other facilities. A smaller TMF could conceivably be designed if the system only needed to operate 12-car trainsets. However, Project ridership forecasts clearly demonstrate that 12-car trainsets are not capable of meeting the demand for the Baltimore-Washington Project, much less the full Washington-New York corridor. Additionally, it is not practical to transition from 12 to 16-car trainsets at some point in the future as this would require guideways be realigned, buildings to be rebuilt, etc. Therefore, 16-car trainsets must be accommodated at the TMF and the 180-acre TMF footprint is required. The 12-car trainset does not meet the Purpose and Need nor the technology and logistics requirements outlined in the USACE review mandate.

**USACE #3:** *The Corps is requiring that the Patapsco Ave TMF be reevaluated for practicability. The Patapsco Avenue TMF should be reevaluated to accommodate a 12-car trainset. Further, the Patapsco Avenue TMF should be evaluated to accommodate a 16-car trainset with the associated additional property acquisitions. These additional acquisitions for the Patapsco Avenue TMF and site impacts should be studied in detail and the analysis submitted to the Corps. We recognize that the configuration of a TMF at the Patapsco Ave location may require a more challenging alignment to efficiently access the facility. However, in comparison to the other TMF alternatives, the Patapsco Avenue TMF has significantly less impacts to waters of the U.S.*

**BWRR Response:** The TMF that was briefly contemplated for a Patapsco site would have required trains departing the mainline to go through the Baltimore station, use tail tracks, and then reverse into the storage yard. This series of train movements would be in direct violation of the JRC SCMAGLEV design criteria for TMF layout. Further, trains leaving the tail tracks for the storage tracks would use the same switches as trains departing the storage tracks for the inspection shop, thereby creating an untenable bottleneck also in violation of the TMF layout design criteria. Reliability would be put at risk due to the train movements required and extensive switching. The use of 16 car trainsets would exacerbate this problem. Patapsco was definitively eliminated.

Additionally, the ARDS Report stated in Appendix B that “The graphical elements and dimensions listed in this report correspond to preliminary 12-car stations... but the proposed train car length will be studied further based on the ridership assessment during preparation of the DEIS.” The Patapsco site was originally considered as a 12-car train facility, but it did not work for any trainset, whether 12 or 16-cars for the key reasons noted above. 16-car trainsets are required to meet the Purpose and Need.

**USACE #4:** *Additionally, TMF alternatives that were removed primarily due to cost or property acquisition requirements should be reevaluated. In the Corps regulatory program, an alternative is practicable if it is available and capable of being done taking into consideration cost, logistics, and existing technology, in light of the overall project purposes. Note that a more costly alternative can still be a practicable alternative.*

**BWRR Response:** BWRR fully understands and agrees with USACE’s definition of practicable alternatives. It is also clear that cost is a consideration. We agree that a more costly alternative could be a practicable alternative, however, this has limits. If there were no limit as to cost, then cost would cease to be a consideration. As already mentioned in our previous answers, sites like Patapsco Avenue were only eliminated for operational reasons or an inability to meet the project purpose and need (i.e., 16-car trainsets to meet forecasted passenger demand). Sites removed for cost were removed as the estimated costs were more than 6 times that of the next best alternate. An approximate cost increase of 600% is neither reasonable nor practicable. While costs may be referenced as the primary concern, the sites also had varying issues related logistics and engineering due to the fact that they did not meet technology and geometric design requirements.

**USACE #5.** *Exhibit J, Section 5.3, Operational Review, states that TMF sizes were able to be reduced from the proposed 235-acre footprint to 180 acres by disaggregating the major operational elements onto separate parcels. This section seems to imply that a disaggregated Patapsco Avenue TMF facility would be constructible, but would require additional material transport time, resulting in a loss of some revenue producing hours. As mentioned in the previous*

*comment, the Corps would like to emphasize that a more costly TMF could still be a practicable one.*

**BWRR Response:** The change in footprint from 235 acres to 180 acres was not related to disaggregation. The 180-acre site is aggregated and streamlined to minimize the footprint while meeting operational requirements. It is based upon the real world TMF design in Japan. As noted above the disaggregated Patapsco TMF results in severe operational problems that are unacceptable to BWRR and JRC, the technology supplier. Technology requirements are a specific consideration required in review of the project. TMF size has been reduced by 24% through a multi-year design collaboration, it is not possible to disaggregate and meet technical requirements. Furthermore, the concept of disaggregating would increase the required land.

**USACE #6:** *Exhibit J mentions that only the TMF alternatives at Patapsco Ave and MD 198 were studied under the notion of functional disaggregation. The Corps recommends that the BARC East and BARC West TMF should also be studied under this concept to determine whether the TMF footprints and associated environmental impacts at these sites could be minimized by separating certain operational elements.*

**BWRR Response:** As previously noted, a disaggregated TMF footprint was investigated but found to not meet technical requirements. This applies to BARC for the same reasons as Patapsco. The minimum 180-acre JRC Chubu design is the smallest footprint and layout that achieves all technical requirements of the technology supplier.

**USACE #7:** *The Corps notes that the BARC East TMF site is located primarily on prior disturbed land, which is advantageous. However, as currently designed, the entrance and exit ramps are proposed for placement in nontidal wetlands of special state concern (NTWSSC) associated with Beaver Dam Creek. Please thoroughly evaluate the practicability of (a) avoiding the impacts to the NTWSSC by realigning the TMF facility and/or realigning the approach ramps and, (b) constructing the approach ramps on bridge structures to minimize impacts to wetlands. Has the BARC East TMF been evaluated for the maximum potential to move the TMF facility into the airfield itself and minimize impacts to Beaver Creek stream and wetlands?*

**BWRR Response:** The BARC East TMF site is located primarily on prior disturbed land and that was the reason for consideration. The ramps are in fact elevated structures, which minimizes impacts to sensitive areas, limited to the pier locations. Changes to the alignment of the approach ramps would require shifting the overall footprint of the TMF itself off of the disturbed land, potentially resulting in negative environmental impacts.

**USACE #8:** *Additionally, the BARC East site was rejected in large measure due to its relative proximity to the NASA Goddard Geophysical and Astronomical Observatory (GGAO). It is mentioned in various Exhibits that BWRR feels that it would be able to mitigate NASA's concerns associated with frequency interference, EMF, vibrations, and light impacts. The Corps requires that BWRR initiate in-depth consultation with NASA to discuss the proposed mitigation measures and determine whether a TMF facility at BARC East could satisfy NASA's concerns.*

**BWRR Response:** Vibrations and EMF are minimal. BWRR's review of the frequency spectrum indicates that BWRR operational frequencies are outside the range utilized by NASA (with the exception of products such as cell phones, which are used on public roads, etc. in the vicinity of

the NASA facility). Light impacts can be mitigated. BWRR has had multiple meetings with NASA to address their concerns. Most recently, the BWRR Project team along with FRA officials, met with NASA on October 8<sup>th</sup>, 2020 to provide a project update and answer their questions. At the conclusion of the October 8<sup>th</sup> meeting, NASA made clear to BWRR and the FRA that they have no issue with BARC West and are only concerned about BARC East. BWRR welcomes a technical discussion with NASA which could be further facilitated by the Corps given its desire to satisfy NASA concerns. BWRR is ready to meet with NASA at any time.

**USACE #9:** *The Corps has not conducted a field review of the potential TMF site location at MD 198. We understand that this facility may be more costly, require more complex engineering, and potentially greater environmental impacts. That said, without having visited the site, the Corps cannot provide a comprehensive assessment of its regulatory feasibility. We request to field review the MD 198 TMF site with BWRR personnel.*

**BWRR Response:** A site visit to the MD-198 TMF by USACE, MDE and the NEPA team occurred on March 5, 2021. BWRR appreciates USACE's participation in the site visit.

### **Trainset Maintenance Facility (TMF) Alternatives Assessment Comparison**

**USACE #1:** *Section 7.2 states that TMF facilities that would require any residential acquisition were eliminated from consideration. Did the project conduct any kind of survey(s) to determine the opinions of the residential properties that would have to be bought out in order to construct these TMFs? It is possible that if residents were in favor of being bought out, one or more of these TMF sites could provide a lesser damaging environmental alternative to the three sites being currently evaluated?*

**BWRR Response:** The intent used was not "any" residential acquisition would eliminate a TMF, rather that residential displacement and impact was a critical factor to be used in evaluation based on the communications form the MDOT Secretary noted previously. From the beginning of the project development, BWRR has been conducting community outreach. To date we have had over 200 meetings with county councils, civic groups, communities' associations, and private landowners among others. So far, as could be expected, residential acquisitions has been met with strong resistance by the residents and communities. No desire to be bought out and relocated has been raised by any resident. This is particularly evident when there are reasonable and practicable alternatives that would not entail residential impact and displacement. Nonetheless, BWRR will continue its outreach efforts. The three alternatives retained were retained due to them meeting technical requirements, and being the least damaging environmental alternative, when you include impacts to people as part of the environment.

**USACE #2:** *An additional criterion of the TMF was for TMF ramps to connect to the mainline above ground. The description for this criterion states that, in addition to increased cost, ramps connecting below ground would have unacceptable surface impacts associated with the construction of underground switchboxes, tunnel transition portals and ventilation facilities that would pose substantial impacts to the human and natural environment. TMF alternatives #1-3 were removed based on this criterion, though TMF alternative #1 (Greenbelt, MD, East of BWP) would only impact 1 acre of wetland, compared to 4 acres with the sponsor's proposed alternative at BARC West. Please elaborate on the environmental impacts associated with placing these facilities below ground and why they are considered unacceptable.*

**BWRR Response:** All three sites would still have substantial environmental impacts. Regarding sites #1 and #2, ramps must depart the mainline at a straight section, which would make the ramps leave the mainline in locations well south of the TMF requiring land disturbance and property impacts from top-down construction of the ramps and switchbox, and lengthy areas of open cuts where the ramps daylight. Top-down construction and open cut areas, which would result in severe impacts to the human environment and residential properties. This would require residential takings for top-down construction and areas of open cut where the ramps daylight, see the screenshot below for reference. Site # 2 would greatly impact the Greenbelt Forest Preserve. Site #3 impacts 34 acres, more acres than the BARC sites or MD-198.

Additionally, as noted in our Alternatives Analysis (Exhibit F of the JPA), *“The determination of what constitutes an unreasonable expense should generally consider whether the projected cost is substantially greater than the costs normally associated with the particular type of project.”* In the case of below grade ramps, the expected cost increase would be more the six (6) times the cost of using an above ground installation. BWRR estimates the cost of underground ramps to increase the TMF site cost by \$500,000,000. Without going underground, the TMF Civil costs is expected to be approximately \$80,000,000. These estimates are for site work only ( $\$500,000,000 / \$80,000,000 = 6.25$ ).



