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# Switchback: Evidence of a Connection between *Kwan-li-so* No. 16 and the *Punggye-ri* Nuclear Test Facility?

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THE COMMITTEE FOR  
HUMAN RIGHTS IN NORTH KOREA  
북한인권위원회

## SWITCHBACK: EVIDENCE OF A CONNECTION BETWEEN KWAN-LI-SO NO. 16 AND THE PUNGGYE-RI NUCLEAR TEST FACILITY?



**Location:**  
P'unggye-ri, North Hamgyŏng Province

**CenterPoint Coordinates:**  
41.2831 N, 129.0981 E

**Date of Report:**  
October 17, 2023

**Date of High-Resolution Imagery:**  
March 4, 2022  
October 19, 2022

### Background

The Punggye-ri Nuclear Test Facility is North Korea's only known nuclear test site. It is located 17.2 km north of the village of Punggye-ri, North Hamgyong Province on the southern slopes of Mant'ap-san (Mount Mant'ap). The full nuclear test facility extends south from the mountain for 10 km along a river valley.

Established in the early 2000s, this facility has been the location of North Korea's six underground nuclear weapons tests, conducted in 2006, 2009, 2013, twice in 2016, and 2017. These tests were carried out within two of four known tunnels beneath Mant'ap Mountain. Available information indicates that the facility has been prepared for a seventh test over the past two years, contrary to its announced closure in 2018, and that North Korea could conduct another test at any time of its choosing.<sup>1</sup>

Approximately 1.5 km east of the underground nuclear testing area is political prison camp (*kwan-li-so*) No. 16 (Hwasong). The two areas share a boundary of approximately 16.5 km. Hwasong is one of four known active political prison camps in North Korea.

Available satellite imagery indicates that the facility has been in operation since at least 1983.<sup>2</sup> Former guards and prisoners at *kwan-li-so* facilities attest that prisoners are subject to heavy forced labor under dangerous conditions and provided with meager food rations.<sup>3</sup>

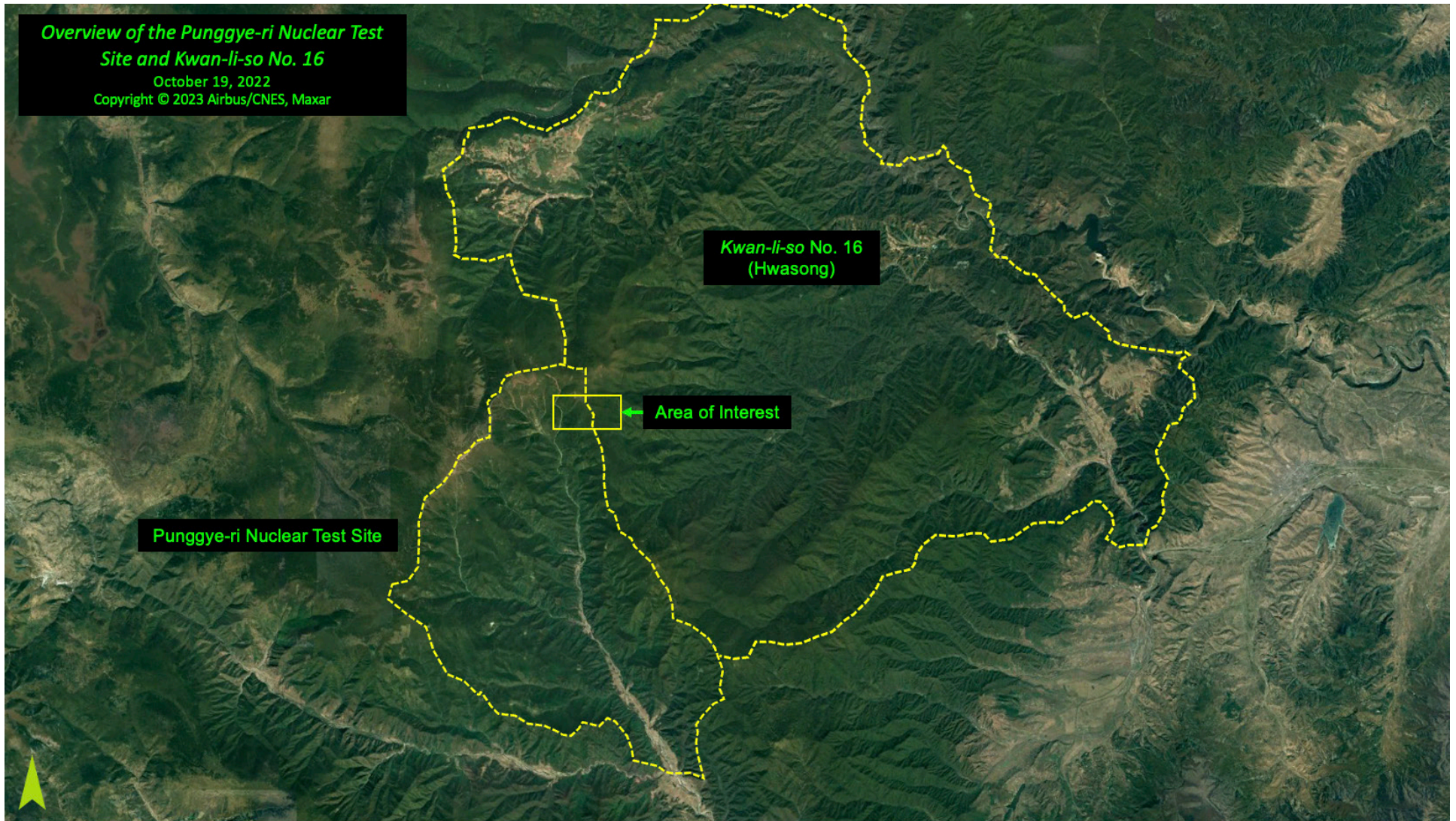
This is in violation of the Convention Concerning Forced or Compulsory Labour, 1930 (No.29), Article 7 of the International Covenant on Economic, Social and Cultural Rights, and Articles 23 and 24 of the Universal Declaration of Human Rights.

Beginning at Punggye-ri Tunnel No. 1 (also known as the East Portal), there is a dirt or gravel switchback road that runs for a total length of 5.2 km from the testing tunnel to the perimeter of Camp 16. The shape of the road suggests a steep decline from Camp 16 to the testing tunnel. This road is visible in all commercial satellite imagery reviewed for this report, dating back to 2005.

There have been no first-hand accounts from former guards, escapees, or witnesses of Camp 16 about this road. However, the camp's proximity to the nuclear test site and the alleged use of forced labor at Punggye-ri requires a close examination of what this road may have been used for.



Figure 1



Overview of the Punggye-ri Nuclear Test Site and Kwan-li-so No.16

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The Committee for Human Rights in North Korea assesses that there are four plausible explanations for the existence of this road. It should be noted that these explanations are not mutually exclusive, as the road may have been used for several purposes.

1. The road may be used to transport prisoners from Camp 16 to the nuclear test facility for forced labor.
2. The road may be used to provide access along the mountainside to place monitoring equipment to gauge the effects of underground nuclear tests.
3. The road may have been used during the initial planning and construction stages by authorities to assess the suitability of the area's geology for conducting underground nuclear tests and for the construction of Tunnel No. 1.

4. The road may be used by Punggye-ri security personnel to access the facility's northeast boundaries for conducting security patrols and surveillance of the area.

### Use for Forced Labor Transport

The Punggye-ri Nuclear Test Facility has been developed since the early 2000s. It consists of a system of four tunnels, each extending hundreds of meters into Mant'ap Mountain through ancient volcanic deposits, a layer of basalt, and a core of diorite or granite.<sup>4</sup>

North Korea has a shortage of modern mining and tunneling equipment.<sup>5</sup> Even their most ambitious construction projects are largely completed with manual labor and outdated equipment. In addition to heavy duty drilling equipment, the construction of the tunnel complex at Punggye-ri would thus have necessitated a large workforce.

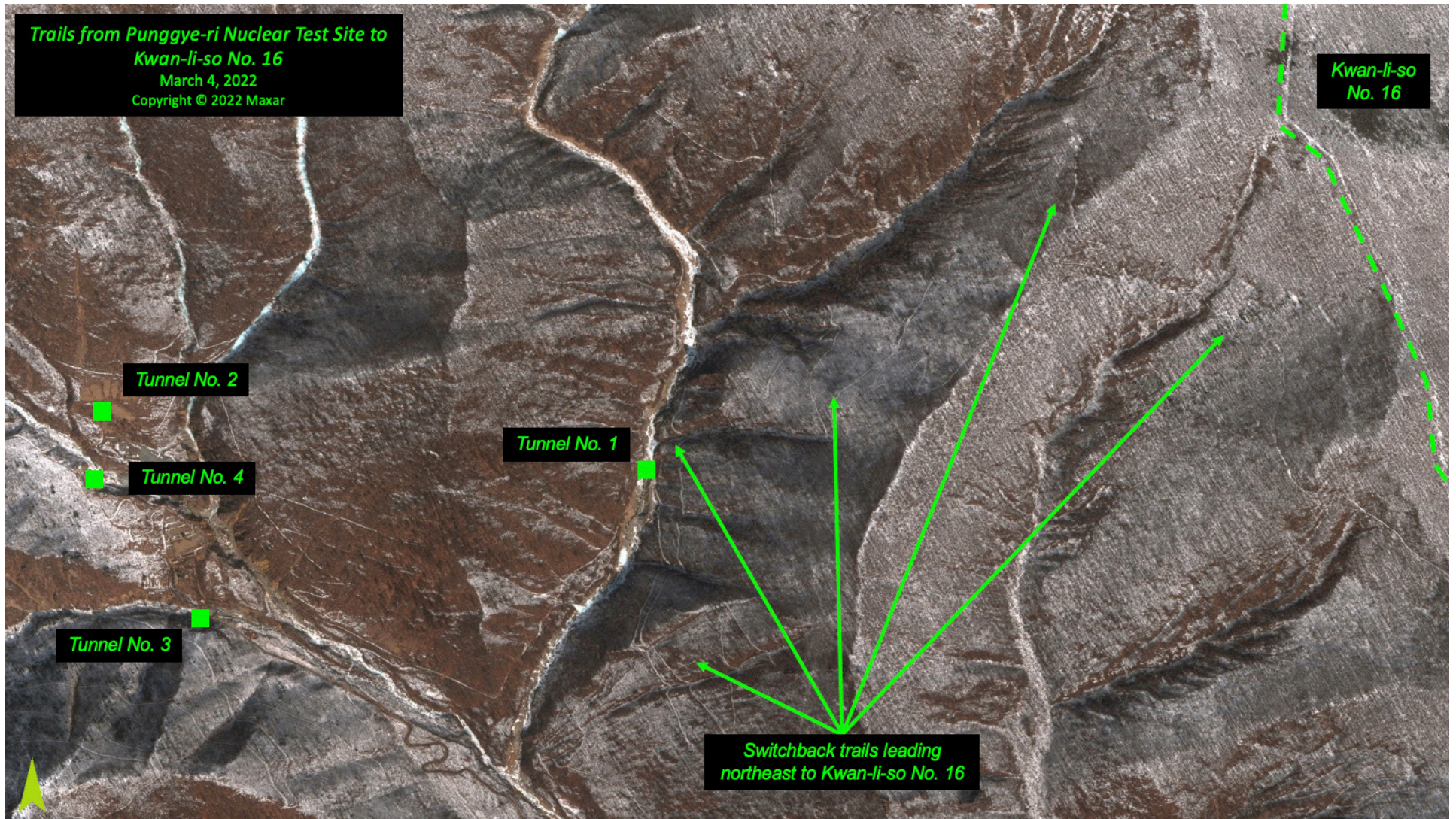
Camp 16, which is only 1.5 km away from the underground test site, has an estimated prisoner population of at least 20,000.<sup>6</sup>

The proximity of the test facility to Camp 16, the need for a labor force for tunnel excavation, and Camp 16's readily available population of prisoners for manual labor projects are compelling reasons to associate the two entities. Given the highly sensitive nature of the project, it is plausible that the North Korean regime would have deployed a labor force over which it exercises total control—political prisoners. The regime would also not have had any qualms about exposing political prisoners to the serious health and safety risks associated with constructing or maintaining a nuclear testing facility, as it regards political prisoners as “poisonous grass” that must be rooted out.<sup>7</sup>

Nonetheless, there is little—if any—open-source information that provides robust evidence about the nature of the connection between Camp 16 and the Punggye-ri Nuclear Test Facility. Caution must therefore be exercised. Commercial satellite imagery can only reveal large-scale ground activities, not motivation or political directives. Moreover, at present, reports based on secondhand and thirdhand knowledge cannot be confirmed.



Figure 2



Trails from Punggye-ri Nuclear Test Site to Kwan-li-so No. 16



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One of two readily available sources alleging the use of forced labor from Camp 16 at the Punggye-ri Nuclear Test Facility is a June 2009 article in the South Korean newspaper *Chosun Ilbo*.

*It has been virtually impossible to find any North Korean citizens who said they were involved in constructing the nuclear testing facilities. The 1994 testimony of Ahn Myeong-cheol, who served as a guard at a camp [Camp 22] for political prisoners in Hoeryong, North Hamgyong Province, provides the only exception. Ahn said that from the early 1990s, young political prisoners from camps in Hoeryong, Jongsong, and Hwasong were taken to an underground construction site at Mt. Mantap and that he had always been curious about what the purpose was.*

*Mt. Mantap was a source of fear among the political prisoners. Once taken there, no one came back alive...*

*According to rumor, Kim Chang-bok, a former chief of the People's Armed Forces, and other top officials of the Workers' Party met their end in Hwasong. That the underground test site and the political prison camp are adjacent may be coincidental. But North Korean defectors are convinced that the underground nuclear test facilities were built using political prisoners. It is not a secret that North Korea has been employing political prisoners for dangerous construction work.<sup>8</sup>*

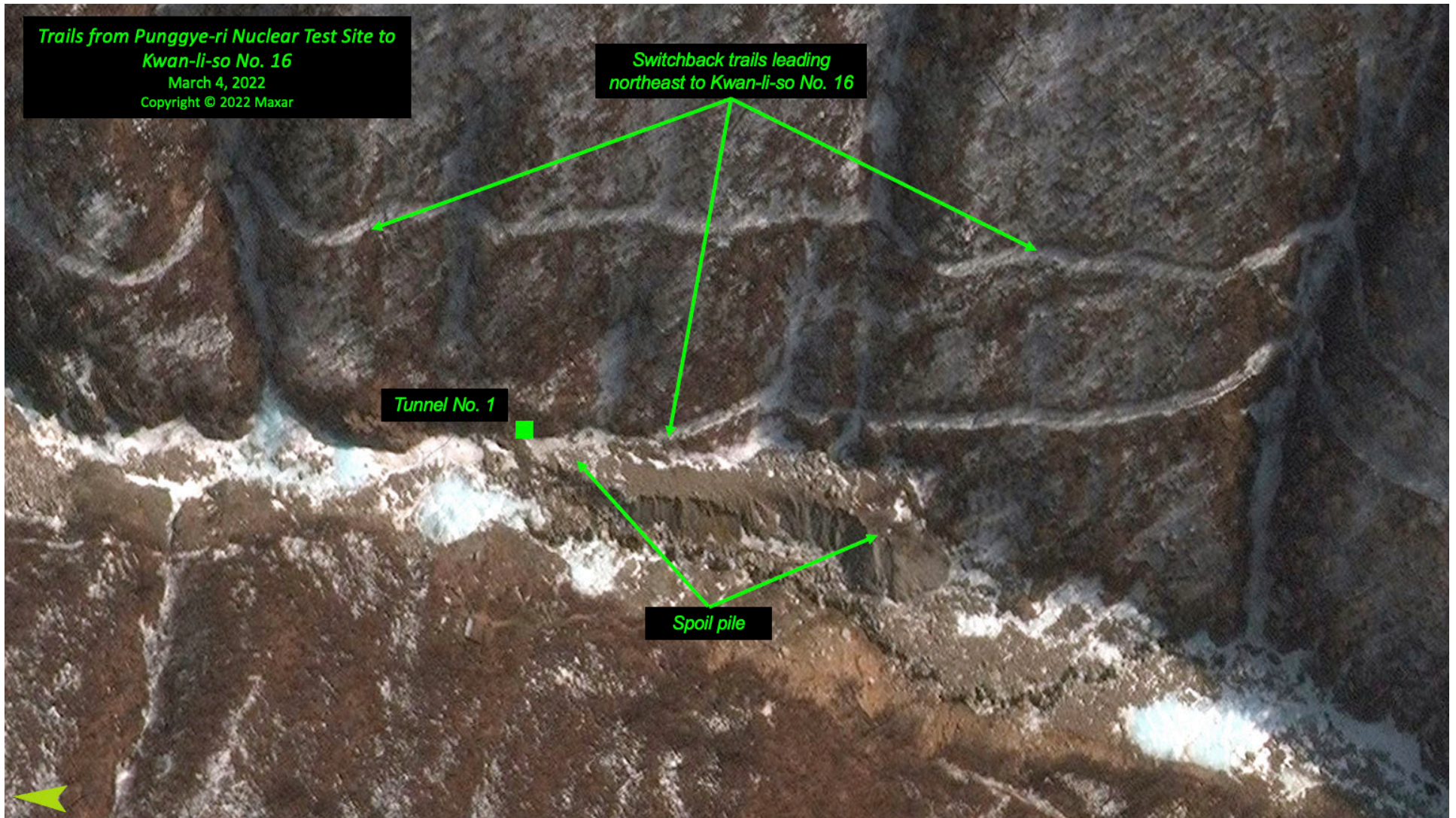
The other readily available source is a January 2016 article published by *Daily NK*. This article is based on an unnamed source inside North Korea which states,

*My understanding is that the state had mobilized prisoners from kwanliso 16 to the Punggye-ri site for digging purposes... Before they carry out the test, everything needs to be done secretly, which is why they mobilized political prisoners, who are easy to control rather than members of the general public.*

The source, identified as being from North Hamgyong Province, added that "Camp 16 prisoners were mobilized from the very beginning when the test site was created."<sup>9</sup>

Using the region's established road network to travel from Camp 16 to the test facility would require a journey of over 80 km from the camp's main entrance to Tunnel No. 1. The switchback, however, is only 5.2 km long and is traceable up to the camp's perimeter. Moreover, an internal patrol path used by camp guards lies just 100 meters to the east of the switchback's terminus. Camp 16 is not completely enclosed within a single fixed security fence or wall. There is a 119-km-long network of security fences, patrol paths, and roads to secure the facility, along with 35 guard positions.<sup>10</sup> This would enable prisoners to be walked across the boundary, under guard, and onto the switchback road leading to Punggye-ri without the need for permanent guard posts or gates in the area.

Figure 3



Trails from *Punggye-ri* Nuclear Test Site to *Kwan-li-so* No. 16



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A clear connecting path between the switchback's terminus and the guard path 100 meters to its east is not readily identifiable in available satellite imagery. However, this does not rule out the path being used for occasional and short-term purposes, such as during tunnel construction or after a nuclear test to locate and repair any damage to other portions of tunnels needed for future testing.

### Use for Monitoring Equipment

Diagnostic, monitoring, and recording equipment is required for each nuclear test to measure the success and yield of the test, monitor for any accidental release of radionuclides, monitor the surface for any deformation or signs of irreversible strain on the rock strata overlying the test area, and for a range of other data needed to further refine the design of nuclear warheads. Three short spur paths branch off from the main switchback, each less than 1 km in total length.

They each end at a cleared platform, and their locations plot along the conjectured layout of Tunnel No. 1.<sup>11</sup> This suggests that the platforms may have been used to place monitoring equipment during the useful life of the tunnel.

### Use for Geologic Testing

Mant'ap Mountain and the surrounding area lies within the Jangbaekjeonggan (also called Hamgyong) Mountain Range, which consists of a range of extinct volcanoes and overlies a seismically quiescent region on a stable Precambrian basement complex.<sup>12</sup> However, Mant'ap Mountain is situated near the boundary of two massifs.<sup>13</sup> This potentially complicates its geologic structure. Despite the general seismic stability of the area as a whole, earthquakes do sometimes occur within North Korean territory and could negatively impact the testing area. Prior to the establishment of the site as an underground nuclear testing facility, extensive geologic and seismic testing would have been required to ascertain the location's suitability as a testing site, as well as any long-term safety risks.

Additional testing would have been carried out during the construction of Tunnel No. 1 to identify and avoid any dangerous faults and fissures, and to monitor the stability of the overburden and verify its ability to contain the planned nuclear explosion. These activities would have required core drilling to retrieve geologic samples and a review of seismic data. As the road and its spurs predate the 2006 nuclear test and extend across the mountainside above Tunnel No. 1, the switchback may have provided access to drilling sites associated with the tunnel.



Figure 4



Trails from Punggye-ri Nuclear Test Site to  
Kwan-li-so No. 16  
March 4, 2022  
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Trails from Punggye-ri Nuclear Test Site to Kwan-li-so No.16



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### Use for Nuclear Test Facility Security

Punggye-ri is one of North Korea's most sensitive military installations. As such, the test site has several layers of security, with security increasing as one approaches the underground test area. Part of the site's security is provided by its remote location and mountainous terrain, but there is still a need for manned patrols. As noted above, Camp 16 is not enclosed by a continuous security fence. It would be necessary for security personnel to conduct foot patrols along the facility's perimeter to prevent accidental or purposeful incursions into the test site by prisoners or other unauthorized persons.

This switchback provides access to the northernmost reaches of the test facility, and it is the only identified path reaching the eastern boundary of the facility for 4 kilometers.

### The Switchback Highlights the Security and Human Rights Nexus

While there are four plausible explanations for the existence of this road that are not mutually exclusive, as stated above, the switchback illustrates and emphasizes the nexus between security and human rights in North Korea.

In order to procure the resources it needs to develop its nuclear program, the North Korean regime exploits its people at home and abroad. If the road is used to transport prisoners from Camp 16 to the nuclear test facility for forced labor, this provides a brutally direct link between North Korea's use of political prison camp labor and the development of its nuclear program.

If the road is used to provide access along the mountainside to place monitoring equipment to gauge the effects of underground tests, it means that there can be no Complete, Verifiable, Irreversible Denuclearization (CVID) of North Korea without access to the political prison camps. For as long as *kwan-li-so* such as Camp 16 are off-limits and North Korea even denies their existence, equipment may be hidden within the perimeter of these detention facilities, rendering CVID impossible. Access to the camp is essential in the process of ensuring CVID, which continues to be the top objective of U.S. policy toward North Korea.

After more than 30 years of sidelining human rights in favor of otherwise very important political, security, and military issues without any results, it is time for the United States and like-minded states to adopt a "human rights up front" approach toward North Korea.

### Recommendations

1. North Korea must end underground nuclear testing, rejoin the Treaty on the Non-Proliferation of Nuclear Weapons, and join the Comprehensive Nuclear-Test-Ban Treaty.
2. North Korea must allow international inspectors unfettered access to the Punggye-ri Nuclear Test Facility to verify and monitor North Korea's compliance with UN resolutions regarding the development and testing of nuclear weapons.



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3. North Korea must allow international observers access to *kwan-li-so* No. 16 and other political detention facilities to assess the health of its prisoners and gather data regarding the treatment of prisoners, the use of forced labor, and any evidence of torture, forced abortions, and other human rights abuses.
4. The placement of a nuclear test facility next to a prison camp with at least 20,000 men, women, and children and within 40 km of the towns of Hwasong, Kilju, and Myongchon places all of the residents at risk from accidental radiation leaks, as is suspected to have occurred during the 2006 and 2013 nuclear tests.<sup>14</sup> Furthermore, “the smuggling and distribution of agricultural and marine products from North Korea” could also pose health risks to individuals in South Korea, Japan, and China.<sup>15</sup> North Korea must adhere to all relevant domestic laws and international agreements it is party to regarding the protection of human health, occupational safety, and the protection of the environment.
5. Continued monitoring of both the Punggye-ri Nuclear Test Facility and *kwan-li-so* No. 16 is needed to determine ongoing activities and if there are any detectable signs of inter-facility operations, such as prisoner transfers to the test facility.

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### Note

HRNK dedicates this report to the late Ronald Bohmuller. For several years, he applied his extraordinary knowledge of satellite imagery to investigating North Korea's detention facilities, making important contributions to HRNK's efforts to bring truth, freedom, peace, justice, and human rights to the people of North Korea.

HRNK would like to extend a special note of thanks to Bobby Holt for his contributions to this project.

HRNK is always grateful to veteran imagery analyst Al Anderson for his staunch and unwavering friendship, wise counsel, and support.

HRNK would also like to express sincere gratitude to Joseph Han Sung Lim for his editorial work and designing this report.



## Endnotes

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Since its establishment in 2001, HRNK has played an important intellectual leadership role on North Korean human rights issues by publishing over 50 major reports (available at <https://hrnk.org/publications/hrnk-publications.php>). HRNK became the first organization to propose that the human rights situation in North Korea be addressed by the UN Security Council. HRNK was directly, actively, and effectively involved in all stages of the process supporting the work of the UN Commission of Inquiry. HRNK has been invited numerous times to provide expert testimony before the U.S. Congress. In April 2018, the UN Economic and Social Council (ECOSOC) granted HRNK UN consultative status.

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All satellite imagery in this document: Airbus/CNES and Maxar