

Environmental Assessment Terms of Reference

of the

**BHP Diamonds Inc.
Beartooth, Pigeon and Sable Kimberlite Pit
Mine Extension**

Issued by:

**The Mackenzie Valley Environmental
Impact Review Board**

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**ENVIRONMENTAL ASSESSMENT TERMS OF REFERENCE
FOR THE PROPOSED
BHP DIAMONDS INC. MINE EXTENSION**

1 INTRODUCTION

On April 16, 1999 the Northwest Territories Water Board referred BHP Diamonds Inc.'s proposed Beartooth, Pigeon, and Sable Kimberlite pipe development (proposed development) to environmental assessment (EA). The preliminary screening of this proposed development was initiated through the application for a water licence.

The proposed development was referred to environmental assessment because of unknown impacts on the Exeter drainage basin, for cumulative impact considerations with the existing BHP Ekati™ Diamond Mine and the proposed Diavik Diamond Mine, for public concern reasons, and to ensure a broader review of the proposed development proposal.

1.1 Purpose of The Terms of Reference

The Environmental Assessment Report (EAR) will address the following Terms of Reference (ToR). The EAR will assist the Mackenzie Valley Environmental Impact Review Board (Review Board) in understanding the environmental consequences of the proposed development, and will help BHP Diamonds Inc. (BHP, developer or proponent) in its development planning and decision making.

The ToR describe the Review Board's expectations of BHP for the use and integration of public consultation and traditional knowledge in the EAR and throughout the EA process. The Review Board has determined what it considers to be the development, and to what extent the interactions between components of the proposed development and the environment will be looked at in the EA. The Review Board also requests the developer to demonstrate its capacity and ability to undertake the proposed development in an environmentally safe and sustainable manner.

All public documentation related to this proposed development is available on a public registry file that is maintained by the Review Board. The EAR and all other submissions to the public registry will be used by the Review Board in its determination, reasons for decision and report of environmental assessment.

This EA will be conducted according to Part V of the *Mackenzie Valley Resource Management Act* (Act). The final determination of significance shall be made by the Mackenzie Valley Environmental Impact Review Board.

1.2 Public Consultation

The Review Board directed its staff to attend BHP community/stakeholder meetings held

43 in Lutsel K'e, Dettah, N'dilo, Yellowknife, Kugluktuk and Rae-Edzo, and with the North
44 Slave Metis Alliance. In addition to attending the BHP community/stakeholder meetings,
45 the Review Board's staff held information sessions in Wha Ti, Wekweti, Gameti and Fort
46 Resolution. The Review Board provided regular newspaper notices, monthly
47 environmental assessment updates, regular press releases, and communicated by
48 telephone and fax with communities and organizations that might have an interest in the
49 environmental assessment of the proposed development. The Review Board also took
50 into account the *NWT Diamond Project Report of the Environmental Assessment Panel*
51 (panel report) dated June 1996.

52
53 The purpose of public consultation is to inform those who may be affected by BHP's
54 proposed development and to provide them the opportunity to participate in the process.
55 The Review Board has decided that this includes as a minimum, the residents, First
56 Nations, Metis, and Inuit organizations in Gameti, Wekweti, Wha ti, Rae-Edzo,
57 Yellowknife, Dettah, N'dilo, Lutsel K'e, and Kugluktuk. This does not prevent BHP from
58 including industrial, recreational, environmental and other recognized individuals, groups
59 and organizations who have an interest in the proposed development. BHP shall provide
60 adequate public notification that it is preparing an EAR, and advise the public of
61 opportunities to provide input so that they may be involved in the environmental
62 assessment process.

63
64 BHP Diamonds Inc. shall describe public consultation objectives including programs and
65 activities undertaken and committed to regarding:

- 66 I. Methods used to identify, inform and solicit input from potentially interested
67 parties
- 68 II. Those that provided comments and input
- 69 III. Outcomes of consultation including any additional information provided by
70 those consulted
- 71 IV. Key concerns identified
- 72 V. Major differences in views between those consulted
- 73 VI. Agreements or commitment to agreements with interested participants and/or
74 communities
- 75 VII. Issues tracking and management; and
- 76 VIII. An indication of how consultation affected the outcome of predicting impacts
77 and determining mitigation, as well as, affecting the design of the proposed
78 development.

79
80 A member of Review Board staff shall be in attendance when BHP Diamonds Inc. is
81 undertaking community consultations. The staff member shall prepare meeting notes
82 that should be confirmed with the meeting participants.

83 84 **1.3 Traditional Knowledge**

85 BHP shall make all reasonable effort to collect and facilitate the collection of traditional
86 knowledge, relative to the proposed development, for integration into the environmental
87 assessment report in collaboration with aboriginal communities and organizations.

88 Where traditional knowledge is not available to the developer, in a timely manner,
89 despite appropriate diligence, the developer will describe efforts taken to obtain it.
90

91 BHP shall describe where and how traditional knowledge was used, and the effect that it
92 had on predicting impacts and determining mitigation.

93 **2 SCOPE OF THE DEVELOPMENT**

94 The Review Board is required to provide a scope of the development according to
95 ss.117 (1) of the Act. This section describes what the Review Board considers the
96 development to be. The scope of the development was determined according to the
97 principles laid out under "scope of the development" in the definitions section. The EAR
98 will be structured according to the scope of the development.

99
100 The proposed Ekati™ Diamond Mine extension scope of the development (Fig. 1) is as
101 follows:

102
103 **2.1 Mining**

- 104 I. Beartooth, Pigeon and Sable pits, and;
105 II. Above ground mining support infrastructure

106
107 **2.2 Mined Rock**

- 108 I. Waste rock storage
109 II. Overburden storage
110 III. Ore storage stockpiles
111 IV. Borrow pits and quarry sites; and
112 V. Tailings and coarse kimberlite rejects
113 VI. Lake bottom sediments

114
115 **2.3 Water Management**

- 116 I. Water management structures (dikes, diversion channels, or pipe intake and
117 delivery systems)
118 II. Lake dewatering
119 III. Pit water management system
120 IV. Sewage treatment and containment areas; and
121 V. Sedimentation ponds

122
123 **2.4 Transport**

- 124 I. All weather haul road from Sable, Pigeon and Beartooth pits to the
125 processing plant
126 II. Roads to borrow or quarry sites; and
127 III. All weather haul roads to waste dumps

128 **Figure 1: Proposed Ekati™ Diamond Mine Extension**
129 Figure 1 was not distributed in the Review Board's facsimile and e-mail distribution of
130 these Terms of Reference.

131 **2.5 Existing Ekati™ Diamond Mine**

132 **For the purposes of this environmental assessment, the Ekati™ Diamond Mine is**
133 **the project as described and considered in the *NWT Diamond Project Report of***
134 ***the Environmental Assessment Panel* dated June 1996.**

135

136 Describe changes, if any, to existing facilities infrastructure and facilities as a result of
137 the proposed development, including:

- 138 I. Existing equipment, infrastructure, and facilities to be used for processing,
139 disposal, storage and transportation
- 140 II. Solid waste management and containment areas
- 141 III. Surface structures (process plant, power plant, magazines, camp(s), roads,
142 airstrip, etc.); and
- 143 IV. Petroleum and chemical storage areas.

144

145 **2.6 Related Considerations**

146 **2.6.1 Development Sequence**

147 Describe the proposed Ekati™ Diamond Mine extension development sequence, in the
148 context of the entire mining operation including traffic on existing haul roads and
149 transportation corridors, current and anticipated exploration activities that will utilize the
150 proposed development infrastructure, and exploration plans as they relate to the
151 proposed development. Also, include a clear rationale for the proposed development
152 sequence in terms of economic risk and uncertainty.

153 **2.6.2 Hazardous Materials**

154 Plans for transporting, handling, storing, using and disposing of hazardous materials
155 forming part of the proposed development.

156 **2.6.3 Accidents and Malfunctions**

157 Probability, potential magnitude, and contingencies in the event of an accident and/or
158 malfunction occurrence, related to the proposed development including, but not limited
159 to:

- 160 I. fuel and other hazardous material spills
- 161 II. water inputs, which exceed retention capacity of the containment areas
- 162 III. key development components such as the tailings (processed kimberlite)
163 containment areas and dikes
- 164 IV. use of pumping as a long-term water management activity to direct surface
165 flow around the Beartooth pit
- 166 V. the tailings (processed kimberlite) containment areas, waste rock (country
167 rock), ore stockpile and overburden storage sites, open pits, sewage facilities
168 and underground workings in the event of a temporary shutdown
- 169 VI. general emergency situations (i.e., fire, natural disasters); and

170 VII. earthquakes, and the low probability hazard from nearby earthquake loads on
171 dikes/containment structures, including failure under earthquake loads.

172 **2.6.4 Closure and Reclamation**

173 Describe, report and evaluate, in relation to the proposed development, the level of
174 confidence associated with implementing and or amending or modifying, the following:

- 175 I. salvaging soils (volume and type) and lake bottom sediments
- 176 II. re-establishing plant communities and a productive landscape
- 177 III. reclamation of containment areas
- 178 IV. reclamation of the waste (country) rock piles
- 179 V. reclamation of all weather haul roads
- 180 VI. reclamation of the dikes
- 181 VII. reclamation of the open pits (mine sites); and
- 182 VIII. re-establishing stable surface drainage and lake recharge.

183
184 Describe opportunities, plans, or amendments to existing plans for progressive
185 reclamation, experimentation and research work that can begin as early as possible in
186 the life of the proposed development; and how the design of proposed development
187 components can assist in meeting the objectives for reclamation. Also, describe the
188 sequence and reclamation costs of the proposed development.

189 **3 ENVIRONMENTAL ASSESSMENT**

190 **The environmental assessment of impacts associated with the proposed**
191 **development, shall to the extent possible, build upon the 1995 Environmental**
192 **Impact Statement, and subsequent environmental management and monitoring**
193 **commitments.**

194
195 This section summarizes how the Review Board expects the environmental impacts will
196 be reported, described, and evaluated. The elements in this section are deemed
197 necessary to satisfy ss.117 (2) of the Act. BHP shall provide information on the
198 environment and how it could be affected by the proposed development. BHP shall also
199 provide a sufficient base for the prediction of positive and negative impacts, and the
200 extent to which negative impacts may be mitigated by planning, development design,
201 construction techniques, operational practices, and reclamation techniques.

202
203 Where a determination on significance is provided in the EAR, BHP shall identify and
204 explain the criteria used in forming its views. The Review Board shall make the final
205 determination of significance.

206

207 **3.1 Environmental Assessment Methodology**

208 **Respecting baseline, management, monitoring, and reporting efforts undertaken**
209 **as part of the 1995 BHP Environmental Impact Statement, and in the subsequent**
210 **construction and operations phases, BHP shall, to the extent possible, use**
211 **existing models and data for impact prediction.**

212 Explicit documentation of the assumptions, models, information sources used, as well as
213 information limitations and associated levels of uncertainty shall support all steps of the
214 environmental assessment report. The analysis should be quantitative where data are
215 available, but where data or models are lacking, best professional judgement may be
216 used. The approach and methodologies used to identify and assess cumulative effects
217 shall be explained.

218 **3.1.1 Alternatives**

219 Include a description of the main development/production/technical alternatives
220 considered for implementing the proposed development. Focus on alternatives related
221 to key elements (infrastructure or activities) of the proposed development, in particular
222 those associated with alternative mine design; alternative sites for waste rock and
223 tailings disposal such as back-filling depleted pits; alternative technologies for tailings
224 management; alternative transportation modes or routes; and decommissioning and
225 reclamation options.

226

227 Alternative kimberlite pit development sequencing, and mitigation measures considered,

228 shall be reported and reasons provided for their rejection.

229 **3.1.2 Description of the Existing Environment**

230 BHP shall provide sufficient information on the existing environment, as it pertains to the
231 proposed development, including the existing mining operation, where appropriate, to
232 give a brief but clear picture of the existing environment and its use. Enough information
233 shall be provided for the prediction of positive and negative impacts, and the extent to
234 which negative impacts may be mitigated by e.g., planning, project design, construction
235 techniques, operational practices and reclamation techniques. Baseline data in existing
236 reports and documents should be appropriately referenced. BHP shall clearly and
237 succinctly describe the following environmental components, as they relate to the
238 proposed development, and all changes to the approved Ekati™ Diamond Mine, as a
239 result of the proposed development:

- 240 I. air quality and climate
- 241 II. surface and ground water quality and quantity
- 242 III. aquatic organisms and habitat
- 243 IV. wildlife and wildlife habitat, including migratory birds
- 244 V. vegetation and plant communities
- 245 VI. terrain, surficial geology, bedrock geology, seismicity, geological hazards,
246 permafrost, soils, and lake sediments
- 247 VII. human health
- 248 VIII. economy
- 249 IX. employment, education and training
- 250 X. infrastructure
- 251 XI. government revenues, cost; and
- 252 XII. social and cultural resources.

253 **3.1.3 Spatial Boundaries**

254 Spatial boundaries shall be scoped based on the maximum zone of influence of the
255 proposed development for each valued ecosystem component that BHP is monitoring.
256 The developer is not required to provide a comprehensive baseline description of the
257 environment, but shall provide sufficient detail to address the relevant impact issues.

258 **3.1.4 Temporal Boundaries**

259 In assessing the impact of the proposed development, the developer shall consider,
260 describe and evaluate the environmental impacts of the proposed development for all
261 phases of the proposed development including construction, operation, care and
262 maintenance, closure and post-closure.

263 **3.1.5 Impact Description and Predicted Outcomes After Mitigation**

264 Describe the impacts resulting from the proposed development, after mitigation, and
265 present those in sufficient detail, including the method used in the analysis and
266 prediction of impacts, to ensure reviewers can easily understand how the direct and

267 indirect impacts were analyzed, and how residual impacts were determined. Information
268 gaps shall be identified along with actions needed to remedy them.

269
270 BHP shall describe each impact identified and the proposed mitigation measure(s) for all
271 phases of the proposed development (i.e., construction, operation, care and
272 maintenance, closure and post-closure).

273
274 BHP shall describe planned mitigation measures and consequences (environmental
275 impacts) of potential failure. The residual impacts should be described at least in terms
276 of the following parameters.

- 277 I. magnitude
- 278 II. geographic extent
- 279 III. timing
- 280 IV. duration
- 281 V. frequency
- 282 VI. irreversibility of impacts
- 283 VII. ecological resilience; and
- 284 VIII. probability of occurrence and confidence level.

285
286 Distinguish between ecological parameters and social / cultural parameters.

287 **3.1.6 Environmental Optimization**

288 The environmental assessment report shall report the comparative costs of proposed
289 development alternatives and the corresponding environmental benefits. Any
290 assumptions or uncertainty surrounding implementation of mitigation measures, such as
291 untested technology, will be reported. The reporting of development impacts should
292 provide readers with a summary, and comparative understanding of development
293 impacts.

294 **3.1.7 Land Use**

295 Describe land and resource uses potentially impacted by the proposed development.
296 Include maps of these land and resources uses in relation to the proposed development.
297 For additional clarity, describe at least the following land and resource uses:

- 298 I. rare or ecologically significant areas
- 299 II. traditionally or spiritually significant areas
- 300 III. renewable resource harvesting areas
- 301 IV. seasonal camp areas
- 302 V. permanent camp areas
- 303 VI. recreational and tourism land uses
- 304 VII. snowmobile trails
- 305 VIII. wildlife outfitting area
- 306 IX. Echo Bay winter road; and
- 307 X. Echo Bay winter road camps and quarry land use permits.

308

309 **3.2 Environmental Impacts**

310 The environmental assessment report shall report impacts resulting from the proposed
311 development on the physical, biological and social, economic and cultural components
312 of the environment.

313 **3.2.1 Air Quality and Climate**

314 Report the impacts of the proposed development on air quality. The analysis shall
315 include a discussion of measures considered to minimize the release of air contaminants
316 (dust, particulate exhaust fumes and other air contaminants). The analysis should also
317 include:

- 318 I. atmospheric dispersion of emissions on a local and regional scale
- 319 II. greenhouse gas emissions including, but not limited to, NO_x and SO_x
- 320 III. atmospheric conversion processes of emissions (e.g. secondary particulates)
321 and linkages between secondary particulates, the environment, and human
322 health
- 323 IV. impact on biological receptors such as vegetation and wildlife; and
- 324 V. potential environmental impacts from particulate matter deposition should be
325 addressed, e.g., dust emissions from road traffic and construction.

326 **3.2.2 Terrain**

327 Report the impacts on the environment when surficial geology, bedrock or soils are
328 disturbed, or used for construction purposes. The environmental assessment shall
329 report impacts resulting from, or on, the terrain and geological components. These
330 should include, but not be limited to:

- 331 I. impacts on the Long Lake processed kimberlite containment area resulting
332 from any changes in tailings disposal management and/or accelerated water
333 inflow resulting from the Pigeon pipe development (including impacts on
334 existing frozen-core dams, or changes to capacity)
- 335 II. impacts of alternatives such as "backfilling" the mined out kimberlite pits with
336 waste rock (especially for pipes that are close together).
- 337 III. the proposed development's impact on the thermal milieu, including:
 - 338 • impact of pit mining activities and infrastructure on permafrost physical
339 conditions (including physical strength characteristics) and thermal regime
 - 340 • potential for thermal erosion in relation to altered drainage
 - 341 • permafrost temperatures and ground ice conditions at mines and
342 roadways, and in material being moved
- 343 IV. sensitivity of boggy / wetland terrain to drainage and thermal alterations
344 (notably in relation to Pigeon pipe development)
- 345 V. with respect to aggregate use, including massive ground ice and granular
346 resource extraction, limitations on volumes of resource material and
347 minimization of terrain disturbance associated with ground ice thaw
- 348 VI. rock types, including the chemistry of pipes and stability of kimberlite by-
349 products

- 350 VII. slope stability of pit walls
- 351 VIII. seismicity and potential for rock heave
- 352 IX. amount of overburden, sediments, and rock to be removed.
- 353 X. acid rock drainage potential and associated mitigation (including sub-
- 354 aqueous disposal option); and
- 355 XI. impact of remedial actions at the mine site (waste dumps, tailings).

356 3.2.3 Vegetation and Plant Communities

- 357 The EAR shall analyze impacts of the proposed development on:
- 358 I. local plant communities classified as vegetation cover types in the existing
 - 359 monitoring program
 - 360 II. rare or highly valued species
 - 361 III. long-term, direct and indirect, habitat loss or alteration
 - 362 IV. biodiversity; and
 - 363 V. vegetation productivity.

364

365 This should include a quantitative account of loss of plant communities and could be

366 presented in conjunction with wildlife habitat data.

367 3.2.4 Water Quality and Quantity

- 368 The environmental assessment report shall provide an analysis of proposed
- 369 development impacts on surface and ground waters. This analysis shall include the
- 370 impacts on water quality and quantity, catchment areas and permafrost in relation to:
- 371 I. dredging, in-filling, and impacts of blasting and its associated residues, in
 - 372 particular, nitrogen
 - 373 II. lake bed sediment placement and control of runoff
 - 374 III. impact of Pigeon and Sable kimberlite pipe development on the Exeter water
 - 375 shed
 - 376 IV. dewatering of 393,000m³ of water from Sable to Two-Rock Lake and resulting
 - 377 impacts on the water balance, lake levels, outflow rates, etc. in October and
 - 378 November in Two-Rock Lake
 - 379 V. dewatering lakes in October and November and related impacts on Panda
 - 380 Lake and the diversion channel, nutrient loading (in particular phosphorus),
 - 381 and effects on water bodies down stream where changes may occur that are
 - 382 greater than background variation
 - 383 VI. impact on ephemeral streams and permanent streams which collect and
 - 384 disperse surface water flow
 - 385 VII. impact on water quantity, including changes in timing, volume and deviation
 - 386 of peak and minimum flows due to physical changes in topography,
 - 387 landscape and drainage patterns
 - 388 VIII. impact on the surface and groundwater flows to associated wetlands
 - 389 IX. siltation effects, e.g., runoff along roadways and drainage channels
 - 390 X. subaqueous disposal of potentially acid-generating rock and impact on water
 - 391 quality and aquatic organisms in the subject lake(s)

- 392 XI. the road to the Sable kimberlite pit and water crossings
393 XII. nutrient passage in fish and non-fish bearing water courses
394 XIII. design, and rationale of using pervious rather than impervious dikes for waste
395 water containment at the proposed Sable Kimberlite pit
396 XIV. Water chemistry impacts of surface runoff
397 XV. pit dewatering impacts including the experience gained from previous and on-
398 going BHP Ekati™ Diamond mine operations, and other comparable
399 operations and its applicability to this proposed development;
400 XVI. ground water seepage impacts (through water retention dikes, into pits and
401 underground); and
402 XVII. contingencies for dealing with icing on the pit walls as well as ice removal
403 from the pits.

404 **3.2.4.1 Water Balance**

405 A water balance shall be prepared that incorporates the proposed development's
406 components into the existing water balance of the mine. The water balance shall include
407 water from the Beartooth and Pigeon kimberlite pits, the Sable kimberlite pit retention
408 pond, and the Long Lake processed kimberlite containment area.

409 **3.2.4.2 General Water**

410 The assessment of proposed development impacts on water quality should also
411 consider:

- 412 I. contaminant loading and dispersion (including surface runoff and airborne
413 contaminants)
414 II. acid rock drainage, metal leaching and geochemistry
415 III. sedimentation (plumes and dispersion); and
416 IV. associated kimberlite toxicity and implications for aquatic wildlife.

417 **3.2.5 Aquatic Habitat**

418 The impacts on aquatic organisms and their habitat shall be considered taking into
419 account predicted water quality and quantity impacts from the construction of additional
420 open pits from the dewatering of lakes, excavation of on-land pipes and the associated
421 effects of this activity on fish, fish habitat, and local drainage patterns. The analysis of
422 development impact shall include:

- 423 I. productive capacity of aquatic systems during construction, operations,
424 closure and post-closure
425 II. impacts of works and activities such as creek diversions, and pit restoration
426 III. impact on all lakes likely to have changes to fisheries resources including, but
427 not limited to Two Rock, Beartooth, Pigeon Pond, Ulu, Sable, Upper Panda,
428 and Exeter Lakes, and streams associated with these lakes
429 IV. habitat loss or alteration
430 V. rare and/or sensitive fish species and habitat; and
431 VI. mortality (includes fishing).

432 The principle of *No Net Loss* (*Policy for the Management of Fish Habitat*, DFO, 1986) of
433 fish habitat is to be addressed when the loss of lake and stream habitat is being
434 considered and when various proposed development components are restored
435 (i.e. dikes and waste rock piles). As such, the environmental assessment report shall
436 include an overview of how this principle will be achieved during the construction,
437 operation, care and maintenance and closure stages of the proposed development.

438 **3.2.6 Wildlife and Wildlife Habitat**

439 The environmental assessment report shall provide an analysis of the proposed
440 development's impacts, (both direct and indirect), on wildlife and wildlife habitats,
441 including migratory birds, giving consideration to and demonstrating linkages between
442 predicted physical and biological changes resulting from the proposed development.
443 Special consideration shall be given to species listed as vulnerable or endangered on
444 the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) list. The
445 analysis of development should include:

- 446 I. Impact of loss of terrestrial habitat, and the quality of lost habitat for relevant
447 species, that was not covered in the 1995 EIS
- 448 II. habitat loss or alteration (e.g. fragmentation, connectivity)
- 449 III. disturbance of feeding, nesting, denning or breeding habitats
- 450 IV. improved or altered access impacts
- 451 V. wet-land habitat alteration, loss
- 452 VI. physical barriers to wildlife
- 453 VII. disruption, blockage, impediment and sensory disturbance, of daily or
454 seasonal wildlife movements (e.g. migration, home ranges, etc.)
- 455 VIII. rare, vulnerable, threatened or endangered species as outlined in the
456 Canadian Organization of the Status of Endangered Wildlife in Canada
457 (COSEWIC), as well as, species of international significance
- 458 IX. direct wildlife mortality
- 459 X. indirect wildlife mortality
- 460 XI. reduction in wildlife productivity
- 461 XII. implications of the proposed development acting as an attractant for
462 particular species; and
- 463 XIII. displacement impacts.

464
465 The report should assess the implication of these impacts on the overall health of wildlife
466 populations, communities, and ecosystems.

467 **3.3 Social, Economic and Cultural Components**

469 **3.3.1 Cultural and Heritage Resources**

470 Describe potential impacts of the proposed development on cultural and heritage
471 resources.

472 **3.3.2 Land and Resources Use**

473 Assess the impacts of the proposed development on the use of land, water and
474 renewable resources, including:

- 475 I. traditional land use and occupation
- 476 II. existing land use and occupation
- 477 III. hunting, trapping, and outfitting, recreational, commercial and sport fishing
- 478 IV. availability, abundance and quality of wildlife, fishing, gathering, recreational
479 and commercial land and water-based areas; and
- 480 V. protected areas.

481 **3.3.3 Economy**

482 The impact of the proposed development on the economy, having regard to direct,
483 indirect and induced impacts on income and employment. Any changes from the context
484 of the 1995 EIA, or the BHP Socio-Economic agreement shall be reported including the
485 effects of changes to the pace and scale of the development should be assessed.

486 Consideration must be given to:

- 487 I. wage and salary employment by skills category over the life of the proposed
488 development, including estimates of local and aboriginal participation
- 489 II. activities such as tourism, outfitting, harvesting and recreation
- 490 III. opportunities for local, regional and territorial businesses to supply goods and
491 services both directly to the proposed development and to meet the demand
492 created by the expenditure of contractors and new employees
- 493 IV. opportunities to diversify the northern economic base to produce and to
494 supply new goods and services
- 495 V. barriers to employment
- 496 VI. availability and use of skilled workers in the NWT to meet job requirements
- 497 VII. the impacts on the subsistence economy
- 498 VIII. impacts to hunters, trappers
- 499 IX. federal and territorial revenues and costs
- 500 X. local government finances
- 501 XI. inflation and the cost of living impacts; and
- 502 XII. economic diversification.

503 **3.3.4 Human Health**

504 The environmental assessment report shall analyze the potential development impacts
505 on human health, as they relate to the proposed development, (i.e. physical health,
506 including death and disease rate, psychological, emotional, spiritual, or mental health
507 and wellness).

508
509 Information shall also be provided on the toxicological risks associated with substances
510 hazardous to human health and human exposure to identified hazards via water, air,
511 vegetation and wildlife. Routes of exposure to human populations using an
512 environmental pathway analysis shall be provided, including both routine and accidental
513 release of materials or disposal of waste products.

514 **3.3.5 Government**

515 Assess the impacts of the proposed development on revenues and costs accruing to
516 federal and territorial governments, and the net incremental benefits or costs to these
517 governments arising from the proposed development. BHP shall also report other fee
518 structures/costs BHP will incur such as quarry royalties, changes to security deposits,
519 and incremental abandonment and restoration costs resulting from the proposed
520 development.

521 **3.3.6 Infrastructure**

522 Assess the impacts of the proposed development on existing social, institutional and
523 community services, transportation facilities, services, infrastructure (e.g. transportation
524 safety), and permanent changes to the infrastructure and services arising from the
525 proposed development.

526 **3.3.7 Noise**

527 Assess the impact of the proposed development on the environment resulting from
528 changes to ambient noise levels, continuous exposure versus acute exposure (i.e.,
529 blasting) and the effect of these changes on humans and wildlife.

530 **3.3.8 Visual and Aesthetic Resources**

531 Assess the visual and aesthetic impact of the proposed development. Report design
532 components that mitigate visual and aesthetic impacts.

533
534 **3.4 The effect(s) of the Environment on the Proposed Development**

535 BHP shall assess the effect(s) of the environment on the proposed development, and
536 activities forming part of the proposed development, and existing components of the
537 BHP mine modified as a result of the proposed development. The environmental
538 assessment shall include a discussion of the impacts of the environment on the
539 proposed development, and what BHP has learned to date that it will incorporate into the
540 proposed development. BHP shall consider such things as severe weather, climate
541 change, (e.g., global warming) precipitation and temperature.

542
543 The discussion must specifically describe and assess how the potential for climate
544 change could affect permafrost and soils with high ice content in relation to the integrity
545 of the proposed development infrastructure, particularly the tailings (processed
546 kimberlite) containment impoundment, water retention dikes and waste rock piles.

547
548 **3.5 Cumulative Impact**

549 For the purposes of this development, the environmental assessment shall include an
550 evaluation of cumulative effects that are likely to result from the proposed development
551 in combination with other developments; and developments within the regulatory process

552 on the day these Terms of Reference are issued.

553

554 BHP shall include, as a minimum, the existing BHP Ekati™ Diamond Mine, Diavik
555 Diamond project, and the Echo Bay Mines Ltd. Winter Road and Lupin mine. BHP shall
556 also report and describe developments considered but not included in the cumulative
557 effects assessment, and rationale for the decision.

558

559 BHP shall provide confirmation that all existing facilities, infrastructure, etc., BHP plans
560 to use can adequately handle the demands generated by the proposed development.

561 Include cumulative impacts in relation to:

562

- 563 I. the environment
- 564 II. social environment
- 565 III. economic environment
- 566 IV. cultural environment
- 567 V. heritage resources; and
- 568 VI. visual and aesthetic resources.

569

570 Explicit documentation of the assumptions, models, information sources used as well as
571 information limitations and associated levels of uncertainty shall support all steps of the
572 CEA in the environmental assessment report. The analysis should be quantitative where
573 data are available but where data or models are lacking, best professional judgement
574 may be used. The approach and methodologies used to identify and assess cumulative
575 effects shall be explained.

576

577 **3.6 Abandonment and Restoration**

578 BHP shall provide a complete description of regulations (regulatory framework), industry
579 standards and government agreements that are needed with respect to the closure
580 phase of the proposed development. Where regulatory requirements, industry standards
581 or government agreements exist, their minimum standards, criteria, etc. shall be
582 reported. Based on the implementation of regulatory requirements, government
583 agreements and industry standards, BHP shall identify and report and describe
584 environmental impacts resulting from the proposed development, and mitigation taken to
585 address the impacts. BHP shall provide a clear (visual and textual) description of the
586 proposed development site at closure, and after restoration.

587

588 **3.7 Follow-up Programs**

589 **Follow-up programs should focus on addressing any new concerns and**
590 **environmental management questions that result from the proposed development.**
591 **Proposed follow-up programs shall be clearly described.**

592

593 Describe reporting (feedback) procedures, proposed amendments to existing procedures
594 and any changes within the company's organization in regards to the environmental
595 impacts monitoring program. The intent is to ensure that remedial actions are taken if the

596 results of a monitoring program deviate from any established operational standards on
597 environmental performance or predictions on environmental impacts.

598

599 Provide information on any proposed environmental impacts monitoring program(s) or
600 amendments to existing environmental monitoring program(s), designed to determine
601 the actual environmental impacts as compared with those predicted during the
602 environmental assessment process, measure the performance and of the mitigation
603 measures, and identify unexpected environmental impacts and alternatives. Adaptive
604 management practices already undertaken and incorporated in the mitigation measures
605 should be clearly identified.

606

607 Provide information on any proposed environmental management plans or amendments
608 to existing environmental management plans such as air quality, water quality, materials
609 management, wildlife, traffic, aquatic life, waste, quarry and environmental monitoring
610 and social, economic and cultural monitoring as required.

611

612 **3.8 Compensation**

613 The developer shall provide key elements of its policy on individual compensation and
614 on compensation agreements, contracts or other forms of compensation they have or
615 will negotiate as it relates to mitigating adverse environmental impacts, within the
616 confines of confidentiality.

617 **4 ADDITIONAL DIRECTION FOR THE ENVIRONMENTAL**
618 **ASSESSMENT**

619 **4.1 Executive Summary**

620 BHP shall provide a concise description of all the key facets of the proposed
621 development including the need and purpose for the proposed development in
622 appropriate languages, including the following aboriginal languages; Dogrib,
623 Inuvialuktun, and Chipewyan. This executive summary shall also provide a general
624 outline of the key impacts, issues and proposed mitigation strategies and measures. A
625 succinct description of information distribution, as well as First Nations and public
626 consultation measures taken shall be included.

627
628 **4.2 Developer Identification and Performance Record**

629 BHP shall provide developer information including name of company representatives
630 managing the proposed development. Include company incorporation and structure.
631 Briefly summarize, the developer's corporate history in Canada and the Northwest
632 Territories, and that of its partners. The brief discussion shall include proposed
633 development ownership, organizational structure identifying organizational
634 responsibilities for mine development and operations, and an environmental
635 performance record at the current site.

636
637 BHP shall include a brief and succinct compliance report from the independent
638 environmental monitoring agency. BHP shall provide (as pertaining to the proposed
639 development) a summary of adaptive and incremental improvements incorporated to
640 date in the construction, operations, remediation, and reclamation of the mine, and
641 measures that have contributed to mitigating and/or improving the environmental,
642 economic and human effects of the existing mining operation.

643
644 **4.3 Tenure**

645 Clearly delineate the surface and subsurface extent that BHP to intends to secure
646 through lease or other tenure arrangements for the proposed development.

647
648 **4.4 Developer's Policies**

649 BHP Diamond Inc.'s shall provide its corporate policies on the following:

- 650 I. preserving the environment
- 651 II. limiting the use of fresh water (i.e., recycle, re-use)
- 652 III. the Protected Areas Strategy
- 653 IV. abandonment and reclamation and progressive reclamation
- 654 V. reporting and sharing of adaptive management or learned experiences
- 655 VI. measures to encourage contractors to hire northerners
- 656 VII. education for appropriate personnel to ensure they are aware of their role in
657 the protection of the environment and in emergency response plans;

658 VIII. contracting and procurement, including those which promote local sourcing,
659 participation of local businesses and opportunities for northern businesses
660

661 **4.5 Regulatory Regime**

662 Provide a table and map summarizing and showing relevant licenses, permits and other
663 authorizations that are required, or require amendment to allow the proposed
664 development to occur. Include, for reference purposes, existing permits and other
665 authorizations that remain in force, and do not require amendment to allow the proposed
666 development to occur, and their respective durations.

667 **5 PRESENTATION**

668 **5.1 Conformity**

669 The environmental assessment report shall include a conformity table outlining to
670 reviewers the areas in the report (including appendices and technical reports) that
671 address the specific sections, and where appropriate line items, of the Terms of
672 Reference.

673

674 **5.2 Format**

675 The format of the environmental assessment report is largely left to the discretion of the
676 developer although reviewers must be able to clearly identify where specific issues have
677 been addressed and directions followed.

678

679 **5.3 Appendices**

680 Detailed data shall be contained in appendices and technical reports submitted in
681 support of the primary environmental assessment report.

682

683 **5.4 Data Presentation**

684 The developer should present the environmental assessment report in the clearest
685 language possible. Where technical language is used a glossary defining technical
686 words and acronyms should be included. BHP should provide charts, diagrams and
687 maps wherever useful to clarify the text. Where possible, maps should be of common
688 scale and orientation to allow for comparison and overlap of mapped features. BHP
689 shall also provide the EAR report in electronic format (e.g. CD-ROM).

690 **6 DEFINITIONS**

691 The following are terminology and definitions applied to these Terms of Reference for
692 environmental assessment. Definitions from the Act are italicized.

693

694 **Abandonment** - The point in time when the acquired lease or other tenure
695 arrangements are relinquished and the lessee is released from all responsibilities for the
696 site, and the security deposit returned.

697

698 **Closure** - The point in time when the pits and associated facilities permanently cease
699 production. This includes the decommissioning and reclamation of the site and the
700 implementation of monitoring post-closure programs.

701

702 **Developer** - any person or corporation carrying out an existing or proposed
703 development.

704

705 **Development** - means any undertaking, or any part of an undertaking, that is carried out
706 on land or water and, except where the context otherwise indicates, wholly within the
707 Mackenzie Valley, and includes measures carried out by a department or agency of
708 government leading to the establishment of a national park subject to the National Parks
709 Act and an acquisition of lands pursuant to the Historic Sites and Monuments Act.

710

711 **Environment** - means the components of the Earth and includes a) land, water, air,
712 including all layers of the atmosphere; b) all organic and inorganic matter and living
713 organisms; and c) the interacting natural systems that include components referred to in
714 a) and b).

715

716 **Factors to be considered** - ss. 117(2) Every environmental assessment and
717 environmental impact review of a proposal for a development shall include a
718 consideration of a) impact of the development on the environment, including the impact
719 of malfunctions or accidents that may occur in connection with the development and any
720 cumulative impacts that are likely to result from the development in combination with
721 other developments; b) the significance of any such impact; c) any comments submitted
722 by members of the public in accordance with the regulations or rules of practice and
723 procedures of the Review Board; d) where the development is likely to have a significant
724 adverse impact on the environment, the imposition of mitigative or remedial measures;
725 and e) any other matter, such as the need for the development and any available
726 alternatives to it, that the Review Board or any responsible minister, after consulting the
727 Review Board, determines to be relevant.

728

729 **Follow-up program** - means a program for evaluating a) the soundness of an
730 environmental assessment or environmental impact review of a proposal for a
731 development; and b) the effectiveness of the mitigative or remedial measures imposed
732 as conditions of approval of the proposal.

733

734 **Harvesting** - in relation to wildlife, means hunting, trapping or fishing activities carried on
735 in conformity with a land claim agreement or, in respect of persons and places not
736 subject to a land claim agreement, carried on in pursuant to aboriginal or treaty rights.
737

738 **Heritage Resources** - means archaeological or historical sites, burial sites, artifacts,
739 and other objects of historical, cultural or religious significance, and historical or cultural
740 records.
741

742 **Impact on the environment** - means any impact on land, water, air or any other
743 component of the environment, as well as on wildlife harvesting, and includes any effect
744 on the social and cultural environment or on heritage resources.
745

746 **Mitigative and remedial measures** - means a measure for the control, reduction or
747 elimination of an adverse impact of a development on the environment, including a
748 restorative measure.
749

750 **Post-Closure:** The period of time between closure and abandonment.
751

752 **Protected Areas:** Those areas meeting the criteria under the International Union for the
753 Conservation of Nature (IUCN) definition being an area of land or sea especially
754 dedicated to the protection and maintenance of biological diversity, and its associated
755 natural and cultural resources, managed through legal or other effective means and
756 those existing protected areas designated under federal and territorial legislation, and
757 land claim agreements.
758

759 **Reclamation:** Activities undertaken to modify and reclaim the land and water to
760 acceptable standards.
761

762 **Scope of the development** - means the parts of the overall development that will be
763 included for consideration in the environmental assessment. A rule of thumb for
764 determining scope of the development includes identifying the principle development
765 and any accessory developments and activities.
766

767 **Accessory Developments and Activities** - other developments or activities that are
768 associated with the principle development that are necessary for the principle
769 development to proceed. In order to identify accessory developments or activities the
770 following checks can be applied:
771

- 772 • **Linkage:** It is accessory if the decision to undertake the principle development makes
773 the decision to undertake other developments and activities inevitable.
- 774 • **Interdependence:** It is accessory if the principle development could not proceed
775 without these other developments or activities.
776

777 **Principle Development** - the undertaking or part of an undertaking that a developer
778 proposes.

779 **Tailings:** Material rejected from the mill after the recoverable valuable minerals have
780 been extracted. Also referred to as processed kimberlite. For greater clarity, tailings
781 include the fines that must be contained in a tailings pond, and coarse kimberlite rejects,
782 which can be disposed of on land or used for cover materials for tailings pond closure.
783

784 **Waste Rock:** All materials, except ore and tailings, which are produced as a result of
785 mining. Also referred to as country rock.